

SEQUENCE LISTING

(1) GENERAL INFORMATION:

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(ii) TITLE OF INVENTION: BIOCIDAL PROTEINS

(iii) NUMBER OF SEQUENCES: 59

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(v) COMPUTER READABLE FORM:

(A) MEDIUM TYPE: Floppy disk
(B) COMPUTER: IBM PC compatible
(C) OPERATING SYSTEM: PC-DOS/MS-DOS
(D) SOFTWARE: PatentIn Release #1.0, Version #1.25

(vi) CURRENT APPLICATION DATA:

(A) APPLICATION NUMBER: US 08/002,480
(B) FILING DATE: 04-JAN-1993
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(viii) ATTORNEY/AGENT INFORMATION:

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(2) INFORMATION FOR SEQ ID NO:1:

(i) SEQUENCE CHARACTERISTICS:

(A) LENGTH: 44 amino acids
(B) TYPE: amino acid
(C) STRANDEDNESS: single
(D) TOPOLOGY: linear

(ii) MOLECULE TYPE: peptide

(xi) SEQUENCE DESCRIPTION: SEQ ID NO:1:

Gln	Lys	Leu	Cys	Glu	Arg	Pro	Ser	Gly	Thr	Trp	Ser	Gly	Val	Cys	Gly
1				5					10					15	

Asn Asn Asn Ala Cys Lys Asn Gln Cys Ile Asn Leu Glu Lys Ala Arg
 20 25 30

His Gly Ser Cys Asn Tyr Val Phe Pro Ala His Lys
 35 40

(2) INFORMATION FOR SEQ ID NO:2:

- (i) SEQUENCE CHARACTERISTICS:
 - (A) LENGTH: 36 amino acids
 - (B) TYPE: amino acid
 - (C) STRANDEDNESS: single
 - (D) TOPOLOGY: linear

(ii) MOLECULE TYPE: peptide

(xi) SEQUENCE DESCRIPTION: SEQ ID NO:2:

Gln Lys Leu Cys Gln Arg Pro Ser Gly Thr Trp Ser Gly Val Cys Gly
 1 5 10 15

Asn Asn Asn Ala Cys Lys Asn Gln Cys Ile Arg Leu Glu Lys Ala Arg
 20 25 30

His Gly Ser Cys
 35

(2) INFORMATION FOR SEQ ID NO:3:

- (i) SEQUENCE CHARACTERISTICS:
 - (A) LENGTH: 27 amino acids
 - (B) TYPE: amino acid
 - (C) STRANDEDNESS: single
 - (D) TOPOLOGY: linear

(ii) MOLECULE TYPE: peptide

(xi) SEQUENCE DESCRIPTION: SEQ ID NO:3:

Gln Lys Leu Cys Glu Arg Pro Ser Gly Thr Trp Ser Gly Val Cys Gly
 1 5 10 15

Asn Asn Asn Ala Cys Lys Asn Gln Cys Ile Asn
 20 25

(2) INFORMATION FOR SEQ ID NO:4:

- (i) SEQUENCE CHARACTERISTICS:
 - (A) LENGTH: 27 amino acids
 - (B) TYPE: amino acid
 - (C) STRANDEDNESS: single
 - (D) TOPOLOGY: linear

(ii) MOLECULE TYPE: peptide

09759504-04204

(xi) SEQUENCE DESCRIPTION: SEQ ID NO:4:

Gln Lys Leu Cys Glu Arg Pro Ser Gly Thr Xaa Ser Gly Val Cys Gly
1 5 10 15

Asn Asn Asn Ala Cys Lys Asn Gln Cys Ile Arg
20 25

(2) INFORMATION FOR SEQ ID NO:5:

(i) SEQUENCE CHARACTERISTICS:

- (A) LENGTH: 30 amino acids
- (B) TYPE: amino acid
- (C) STRANDEDNESS: single
- (D) TOPOLOGY: linear

(ii) MOLECULE TYPE: peptide

(xi) SEQUENCE DESCRIPTION: SEQ ID NO:5:

Gln Lys Leu Cys Glu Arg Pro Ser Gly Thr Trp Ser Gly Val Cys Gly
1 5 10 15

Asn Asn Asn Ala Cys Lys Asn Gln Cys Ile Asn Leu Glu Lys
20 25 30

(2) INFORMATION FOR SEQ ID NO:6:

(i) SEQUENCE CHARACTERISTICS:

- (A) LENGTH: 23 amino acids
- (B) TYPE: amino acid
- (C) STRANDEDNESS: single
- (D) TOPOLOGY: linear

(ii) MOLECULE TYPE: peptide

(xi) SEQUENCE DESCRIPTION: SEQ ID NO:6:

Gln Lys Leu Cys Glu Arg Pro Ser Gly Thr Trp Ser Gly Val Cys Gly
1 5 10

Gln Lys Leu Cys Glu Arg Pro Ser Gly Thr Trp Ser Gly Val Cys Gly
1 5 10 15

Asn Asn Asn Ala Cys Lys Asn
20

(2) INFORMATION FOR SEQ ID NO:7:

(i) SEQUENCE CHARACTERISTICS:

- (A) LENGTH: 25 amino acids
- (B) TYPE: amino acid
- (C) STRANDEDNESS: single
- (D) TOPOLOGY: linear

(ii) MOLECULE TYPE: peptide

(xi) SEQUENCE DESCRIPTION: SEQ ID NO:7:

Gln Lys Leu Cys Glu Arg Pro Ser Gly Thr Trp Ser Gly Val Cys Gly
 5 10 15

Asn Asn Asn Ala Cys Lys Asn Gln Cys
 20 25

(2) INFORMATION FOR SEQ ID NO:8:

- (i) SEQUENCE CHARACTERISTICS:
 - (A) LENGTH: 26 amino acids
 - (B) TYPE: amino acid
 - (C) STRANDEDNESS: single
 - (D) TOPOLOGY: linear

(ii) MOLECULE TYPE: peptide

(xi) SEQUENCE DESCRIPTION: SEQ ID NO:8:

Gln Lys Leu Cys Gln Arg Pro Ser Gly Thr Trp Ser Gly Val Cys Gly
 1 5 10 15

Asn Asn Asn Ala Cys Arg Asn Gln Cys Ile
 20 25

(2) INFORMATION FOR SEQ ID NO:9:

- (i) SEQUENCE CHARACTERISTICS:
 - (A) LENGTH: 27 amino acids
 - (B) TYPE: amino acid
 - (C) STRANDEDNESS: single
 - (D) TOPOLOGY: linear

(ii) MOLECULE TYPE: peptide

(xi) SEQUENCE DESCRIPTION: SEQ ID NO:9:

Gln Lys Leu Cys Glu Arg Pro Ser Gly Thr Trp Ser Gly Val Cys Gly
 1 5 10 15

Asn Ser Asn Ala Cys Lys Asn Gln Cys Ile Asn
 20 25

(2) INFORMATION FOR SEQ ID NO:10:

- (i) SEQUENCE CHARACTERISTICS:
 - (A) LENGTH: 50 amino acids
 - (B) TYPE: amino acid
 - (C) STRANDEDNESS: single
 - (D) TOPOLOGY: linear

(ii) MOLECULE TYPE: peptide

(xi) SEQUENCE DESCRIPTION: SEQ ID NO:10:

Glu Leu Cys Glu Lys Ala Ser Lys Thr Trp Ser Gly Asn Cys Gly Asn
 1 5 10 15

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Thr Gly His Cys Asp Asn Gln Cys Lys Ser Trp Glu Gly Ala Ala His
 20 25 30
 Gly Ala Cys His Val Arg Asn Gly Lys His Met Cys Phe Cys Tyr Phe
 35 40 45
 Asn Cys
 50

(2) INFORMATION FOR SEQ ID NO:11:

- (i) SEQUENCE CHARACTERISTICS:
 (A) LENGTH: 20 amino acids
 (B) TYPE: amino acid
 (C) STRANDEDNESS: single
 (D) TOPOLOGY: linear

(ii) MOLECULE TYPE: peptide

(xi) SEQUENCE DESCRIPTION: SEQ ID NO:11:

Glu Val Cys Glu Lys Ala Ser Lys Thr Trp Ser Gly Asn Cys Gly Asn
 1 5 10 15
 Thr Gly His Cys
 20

(2) INFORMATION FOR SEQ ID NO:12:

- (i) SEQUENCE CHARACTERISTICS:
 (A) LENGTH: 50 amino acids
 (B) TYPE: amino acid
 (C) STRANDEDNESS: single
 (D) TOPOLOGY: linear

(ii) MOLECULE TYPE: peptide

(xi) SEQUENCE DESCRIPTION: SEQ ID NO:12:

Glu Leu Cys Glu Lys Ala Ser Lys Thr Trp Ser Gly Asn Cys Gly Asn
 1 5 10 15
 Thr Lys His Cys Asp Asp Gln Cys Lys Ser Trp Glu Gly Ala Ala His
 20 25 30
 Gly Ala Cys His Val Arg Asn Gly Lys His Met Cys Phe Cys Tyr Phe
 35 40 45
 Asn Cys
 50

(2) INFORMATION FOR SEQ ID NO:13:

- (i) SEQUENCE CHARACTERISTICS:
 (A) LENGTH: 50 amino acids
 (B) TYPE: amino acid
 (C) STRANDEDNESS: single
 (D) TOPOLOGY: linear

(ii) MOLECULE TYPE: peptide

(xi) SEQUENCE DESCRIPTION: SEQ ID NO:13:

Glu Leu Cys Glu Lys Ala Ser Lys Thr Trp Ser Gly Asn Cys Gly Asn
1 5 10 15
Thr Lys His Cys Asp Asn Lys Cys Lys Ser Trp Glu Gly Ala Ala His
20 25 30
Gly Ala Cys His Val Arg Ser Gly Lys His Met Cys Phe Cys Tyr Phe
35 40 45
Asn Cys
50

(2) INFORMATION FOR SEQ ID NO:14:

- (i) SEQUENCE CHARACTERISTICS:
(A) LENGTH: 47 amino acids
(B) TYPE: amino acid
(C) STRANDEDNESS: single
(D) TOPOLOGY: linear

(ii) MOLECULE TYPE: peptide

(xi) SEQUENCE DESCRIPTION: SEQ ID NO:14:

Lys Thr Cys Glu Asn Leu Ser Gly Thr Phe Lys Gly Pro Cys Ile Pro
1 5 10 15
Asp Gly Asn Cys Asn Lys His Cys Lys Asn Asn Glu His Leu Leu Ser
20 25 30
Gly Arg Cys Arg Asp Asp Phe Xaa Cys Trp Cys Thr Arg Asn Cys
35 40 45

(2) INFORMATION FOR SEQ ID NO:15:

- (i) SEQUENCE CHARACTERISTICS:
(A) LENGTH: 49 amino acids
(B) TYPE: amino acid
(C) STRANDEDNESS: single
(D) TOPOLOGY: linear

(ii) MOLECULE TYPE: peptide

(xi) SEQUENCE DESCRIPTION: SEQ ID NO:15:

Asn Leu Cys Glu Arg Ala Ser Leu Thr Trp Thr Gly Asn Cys Gly Asn
1 5 10 15
Thr Gly His Cys Asp Thr Gln Cys Arg Asn Trp Glu Ser Ala Lys His
20 25 30
Gly Ala Cys His Lys Arg Gly Asn Trp Lys Cys Phe Cys Tyr Phe Asp
35 40 45
Cys

[illegible]

(i) SEQUENCE CHARACTERISTICS:
 (A) LENGTH: 4 amino acids
 (B) TYPE: amino acid
 (C) STRANDEDNESS: single
 (D) TOPOLOGY: linear

(ii) MOLECULE TYPE: peptide

(xi) SEQUENCE DESCRIPTION: SEQ ID NO:16:

Met Ile Leu Val
1

(2) INFORMATION FOR SEQ ID NO:17:

(i) SEQUENCE CHARACTERISTICS:

- (A) LENGTH: 4 amino acids
- (B) TYPE: amino acid
- (C) STRANDEDNESS: single
- (D) TOPOLOGY: linear

(ii) MOLECULE TYPE: peptide

(xi) SEQUENCE DESCRIPTION: SEQ ID NO:17:

Glu Asp Asn Gln
1

(2) INFORMATION FOR SEQ ID NO:18:

(i) SEQUENCE CHARACTERISTICS:

- (A) LENGTH: 5 amino acids
- (B) TYPE: amino acid
- (C) STRANDEDNESS: single
- (D) TOPOLOGY: linear

(ii) MOLECULE TYPE: peptide

(xi) SEQUENCE DESCRIPTION: SEQ ID NO:18:

Pro Ala Gly Ser Thr
1 5

(2) INFORMATION FOR SEQ ID NO:19:

(i) SEQUENCE CHARACTERISTICS:
 (A) LENGTH: 51 amino acids
 (B) TYPE: amino acid
 (C) STRANDEDNESS: single
 (D) TOPOLOGY: linear

(ii) MOLECULE TYPE: peptide

(xi) SEQUENCE DESCRIPTION: SEQ ID NO:19:

Gln Lys Leu Cys Glu Arg Pro Ser Gly Thr Trp Ser Gly Val Cys Gly
1 5 10 15
Asn Asn Asn Ala Cys Lys Asn Gln Cys Ile Asn Leu Glu Lys Ala Arg
20 25 30
His Gly Ser Cys Asn Tyr Val Phe Pro Ala His Lys Cys Ile Cys Tyr
35 40 45
Phe Pro Cys
50

(2) INFORMATION FOR SEQ ID NO:20:

- (i) SEQUENCE CHARACTERISTICS:
(A) LENGTH: 50 amino acids
(B) TYPE: amino acid
(C) STRANDEDNESS: single
(D) TOPOLOGY: linear

(ii) MOLECULE TYPE: peptide

(xi) SEQUENCE DESCRIPTION: SEQ ID NO:20:

Glu Leu Cys Glu Lys Ala Ser Lys Thr Trp Ser Gly Asn Cys Gly Asn
1 5 10 15
Thr Gly His Cys Asp Asn Gln Cys Lys Ser Trp Glu Gly Ala Ala His
20 25 30
Gly Ala Cys His Val Arg Asn Gly Lys His Met Cys-Phe Cys Tyr Phe
35 40 45
Asn Cys
50

(2) INFORMATION FOR SEQ ID NO:21:

- (i) SEQUENCE CHARACTERISTICS:
(A) LENGTH: 50 amino acids
(B) TYPE: amino acid
(C) STRANDEDNESS: single
(D) TOPOLOGY: linear

(ii) MOLECULE TYPE: peptide

(xi) SEQUENCE DESCRIPTION: SEQ ID NO:21:

Glu Leu Cys Glu Lys Ala Ser Lys Thr Trp Ser Gly Asn Cys Gly Asn
1 5 10 15
Thr Lys His Cys Asp Asp Gln Cys Lys Ser Trp Glu Gly Ala Ala His
20 25 30
Gly Ala Cys His Val Arg Asn Gly Lys His Met Cys Phe Cys Tyr Phe
35 40 45

Asn Cys
50

(2) INFORMATION FOR SEQ ID NO:22:

- (i) SEQUENCE CHARACTERISTICS:
(A) LENGTH: 50 amino acids
(B) TYPE: amino acid
(C) STRANDEDNESS: single
(D) TOPOLOGY: linear

(ii) MOLECULE TYPE: peptide

(xi) SEQUENCE DESCRIPTION: SEQ ID NO:22:

Glu Leu Cys Glu Lys Ala Ser Lys Thr Trp Ser Gly Asn Cys Gly Asn
1 5 10 15

Thr Lys His Cys Asp Asn Lys Cys Lys Ser Trp Glu Gly Ala Ala His
20 25 30

Gly Ala Cys His Val Arg Ser Gly Lys His Met Cys Phe Cys Tyr Phe
35 40 45

Asn Cys
50

(2) INFORMATION FOR SEQ ID NO:23:

- (i) SEQUENCE CHARACTERISTICS:
(A) LENGTH: 47 amino acids
(B) TYPE: amino acid
(C) STRANDEDNESS: single
(D) TOPOLOGY: linear

(ii) MOLECULE TYPE: peptide

(xi) SEQUENCE DESCRIPTION: SEQ ID NO:23:

Lys Thr Cys Glu Asn Leu Ser Gly Thr Phe Lys Gly Pro Cys Ile Pro
1 5 10 15

Asp Gly Asn Cys Asn Lys His Cys Lys Asn Asn Glu His Leu Leu Ser
20 25 30

Gly Arg Cys Arg Asp Asp Phe Xaa Cys Trp Cys Thr Arg Asn Cys
35 40 45

(2) INFORMATION FOR SEQ ID NO:24:

- (i) SEQUENCE CHARACTERISTICS:
(A) LENGTH: 49 amino acids
(B) TYPE: amino acid
(C) STRANDEDNESS: single
(D) TOPOLOGY: linear

(ii) MOLECULE TYPE: peptide

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(xi) SEQUENCE DESCRIPTION: SEQ ID NO:24:

Asn Leu Cys Glu Arg Ala Ser Leu Thr Trp Thr Gly Asn Cys Gly Asn
1 5 10 15
Thr Gly His Cys Asp Thr Gln Cys Arg Asn Trp Glu Ser Ala Lys His
20 25 30
Gly Ala Cys His Lys Arg Gly Asn Trp Lys Cys Phe Cys Tyr Phe Asp
35 40 45
Cys

(2) INFORMATION FOR SEQ ID NO:25:

- (i) SEQUENCE CHARACTERISTICS:
(A) LENGTH: 45 amino acids
(B) TYPE: amino acid
(C) STRANDEDNESS: single
(D) TOPOLOGY: linear

(ii) MOLECULE TYPE: peptide

(xi) SEQUENCE DESCRIPTION: SEQ ID NO:25:

Asn Thr Cys Glu Asn Leu Ala Gly Ser Tyr Lys Gly Val Cys Phe Gly
1 5 10 15
Gly Cys Asp Arg His Cys Arg Thr Gln Glu Gly Ala Ile Ser Gly Arg
20 25 30
Cys Arg Asp Asp Phe Arg Cys Trp Cys Thr Lys Asn Cys
35 40 45

(2) INFORMATION FOR SEQ ID NO:26:

- (i) SEQUENCE CHARACTERISTICS:
(A) LENGTH: 46 amino acids
(B) TYPE: amino acid
(C) STRANDEDNESS: single
(D) TOPOLOGY: linear

(ii) MOLECULE TYPE: peptide

(xi) SEQUENCE DESCRIPTION: SEQ ID NO:26:

Asn Thr Cys Glu His Leu Ala Asp Thr Tyr Arg Gly Val Cys Phe Thr
1 5 10 15
Asn Ala Ser Cys Asp Asp His Cys Lys Asn Lys Ala His Leu Ile Ser
20 25 30
Gly Thr Cys His Asp Trp Lys Cys Phe Cys Thr Gln Asn Cys
35 40 45

(2) INFORMATION FOR SEQ ID NO:27:

[illegible]

(xi) SEQUENCE DESCRIPTION: SEQ ID NO:27:

(2) INFORMATION FOR SEO ID NO:28:

(ii) MOLECULE TYPE: peptide

(xi) SEQUENCE DESCRIPTION: SEQ ID NO:28:

Arg His Cys Glu Ser Leu Ser His Arg Phe Lys Gly Pro Cys Thr Arg
1 5 10 15
Asp Ser Asn Cys Ala Ser Val Cys Glu Thr Glu Arg Phe Ser Gly Gly
20 25 30
Asn Cys His Gly Phe Arg Arg Arg Cys Phe Cys Thr Lys Pro Cys
35 40 45

(2) INFORMATION FOR SEQ ID NO:29:

(i) SEQUENCE CHARACTERISTICS:

- (A) LENGTH: 48 amino acids
- (B) TYPE: amino acid
- (C) STRANDEDNESS: single
- (D) TOPOLOGY: linear

(ii) MOLECULE TYPE: peptide

(xi) SEQUENCE DESCRIPTION: SEQ ID NO:29:

Arg 1	Val	Cys	Met 5	Gly	Lys	Ser	Ala	Gly 10	Phe	Lys	Gly	Leu	Cys 15	Met	Arg
Asp	Gln	Asn 20	Cys	Ala	Gln	Val	Cys 25	Leu	Gln	Glu	Gly	Trp 30	Gly	Gly	Gly

Asn Cys Asp Gly Val Met Arg Gln Cys Lys Cys Ile Arg Gln Cys Trp
 35 40 45

(2) INFORMATION FOR SEQ ID NO:30:

- (i) SEQUENCE CHARACTERISTICS:
 (A) LENGTH: 47 amino acids
 (B) TYPE: amino acid
 (C) STRANDEDNESS: single
 (D) TOPOLOGY: linear

(ii) MOLECULE TYPE: peptide

(xi) SEQUENCE DESCRIPTION: SEQ ID NO:30:

Lys Ile Cys Arg Arg Arg Ser Ala Gly Phe Lys Gly Pro Cys Met Ser
 1 5 10 15
 Asn Lys Asn Cys Ala Gln Val Cys Gln Gln Glu Gly Trp Gly Gly Gly
 20 25 30
 Asn Cys Asp Gly Pro Phe Arg Arg Cys Lys Cys Ile Arg Gln Cys
 35 40 45

(2) INFORMATION FOR SEQ ID NO:31:

- (i) SEQUENCE CHARACTERISTICS:
 (A) LENGTH: 150 base pairs
 (B) TYPE: nucleic acid
 (C) STRANDEDNESS: both
 (D) TOPOLOGY: linear

(ii) MOLECULE TYPE: cDNA

(xi) SEQUENCE DESCRIPTION: SEQ ID NO:31:

GAGCTTTGCG AGAAGGCTTC TAAGACTTGG TCTGGAAACT GCGGAAACAC TGGACATTGC 60
 GATAACCAAT GCAAGTCTTG GGAGGGAGCT GCTCATGGAG CTTGCCATGT TAGAAACGGA 120
 AAGCATATGT GCTTCTGCTA CTTCAACTGC 150

(2) INFORMATION FOR SEQ ID NO:32:

- (i) SEQUENCE CHARACTERISTICS:
 (A) LENGTH: 60 base pairs
 (B) TYPE: nucleic acid
 (C) STRANDEDNESS: both
 (D) TOPOLOGY: linear

(ii) MOLECULE TYPE: cDNA

(xi) SEQUENCE DESCRIPTION: SEQ ID NO:32:

GAGGTTTGCG AGAAGGCTTC TAAGACTTGG TCTGGAAACT GCGGAAACAC TGGACATTGC 60

(2) INFORMATION FOR SEQ ID NO:33:

(i) SEQUENCE CHARACTERISTICS:

- (A) LENGTH: 150 base pairs
- (B) TYPE: nucleic acid
- (C) STRANDEDNESS: both
- (D) TOPOLOGY: linear

(ii) MOLECULE TYPE: cDNA

(xi) SEQUENCE DESCRIPTION: SEQ ID NO:33:

GAGCTTTGCG AGAAGGCTTC TAAGACTTGG TCTGGAAACT GCGGAAACAC TAAGCATTGC 60
GATGATCAAT GCAAGTCTTG GGAGGGAGCT GCTCATGGAG CTTGCCATGT TAGAAACGGA 120
AAGCATATGT GCTTCTGCTA CTTCAACTGC 150

(2) INFORMATION FOR SEQ ID NO:34:

(i) SEQUENCE CHARACTERISTICS:

- (A) LENGTH: 150 base pairs
- (B) TYPE: nucleic acid
- (C) STRANDEDNESS: both
- (D) TOPOLOGY: linear

(ii) MOLECULE TYPE: cDNA

(xi) SEQUENCE DESCRIPTION: SEQ ID NO:34:

GAGCTTTGCG AGAAGGCTTC TAAGACTTGG TCTGGAAACT GCGGAAACAC TAAGCATTGC 60
GATAACAAGT GCAAGTCTTG GGAGGGAGCT GCTCATGGAG CTTGCCATGT TAGATCTGGA 120
AAGCATATGT GCTTCTGCTA CTTCAACTGC 150

(2) INFORMATION FOR SEQ ID NO:35:

(i) SEQUENCE CHARACTERISTICS:

- (A) LENGTH: 141 base pairs
- (B) TYPE: nucleic acid
- (C) STRANDEDNESS: both
- (D) TOPOLOGY: linear

(ii) MOLECULE TYPE: cDNA

(xi) SEQUENCE DESCRIPTION: SEQ ID NO:35:

AAGACTTGCG AGAACCTTTC TGGAACCTTC AAGGGACCAT GCATTCCAGA TGGAAACTGC 60
AACAAGCATT GCAAGAACAA CGAGCATCTT CTTTCTGGAA GATGCAGAGA TGATTTCNNN 120
TGCTGGTGCA CTAGAAACTG C 141

(2) INFORMATION FOR SEQ ID NO:36:

(i) SEQUENCE CHARACTERISTICS:

- (A) LENGTH: 147 base pairs

- (B) TYPE: nucleic acid
- (C) STRANDEDNESS: both
- (D) TOPOLOGY: linear

(ii) MOLECULE TYPE: cDNA

(xi) SEQUENCE DESCRIPTION: SEQ ID NO:36:

AACCTTTGCG AGAGAGCTTC TCTTACTTGG ACTGGAAACT GCGGAAACAC TGGACATTGC 60
 GATACTCAAT GCAGAACTG GGAGTCTGCT AAGCATGGAG CTTGCCATAA GAGAGGAAAC 120
 TGGAAGTGCT TCTGCTACTT CGATTGC 147

(2) INFORMATION FOR SEQ ID NO:37:

- (i) SEQUENCE CHARACTERISTICS:
 - (A) LENGTH: 43 amino acids
 - (B) TYPE: amino acid
 - (C) STRANDEDNESS: single
 - (D) TOPOLOGY: linear

(ii) MOLECULE TYPE: peptide

(xi) SEQUENCE DESCRIPTION: SEQ ID NO:37:

Ala Leu Ser Cys Gly Thr Val Asn Ser Asn Leu Ala Ala Cys Ile Gly
 1 5 10 15
 Tyr Leu Thr Gln Asn Ala Pro Leu Ala Arg Gly Cys Cys Thr Gly Val
 20 25 30
 Thr Asn Leu Asn Asn Met Ala Xaa Thr Thr Pro 35 40 10

(2) INFORMATION FOR SEQ ID NO:38:

- (i) SEQUENCE CHARACTERISTICS:
 - (A) LENGTH: 43 amino acids
 - (B) TYPE: amino acid
 - (C) STRANDEDNESS: single
 - (D) TOPOLOGY: linear

(ii) MOLECULE TYPE: peptide

(xi) SEQUENCE DESCRIPTION: SEQ ID NO:38:

Ala Leu Ser Cys Gly Thr Val Asn Ser Asn Leu Ala Ala Cys Ile Gly
 1 5 10 15
 Tyr Leu Thr Gln Asn Ala Pro Leu Ala Arg Gly Cys Cys Thr Gly Val
 20 25 30
 Thr Asn Leu Asn Asn Met Ala Xaa Thr Thr Pro 35 40

(2) INFORMATION FOR SEQ ID NO:39:

- (i) SEQUENCE CHARACTERISTICS:
 (A) LENGTH: 42 amino acids
 (B) TYPE: amino acid
 (C) STRANDEDNESS: single
 (D) TOPOLOGY: linear

(ii) MOLECULE TYPE: peptide

(xi) SEQUENCE DESCRIPTION: SEQ ID NO:39:

Gly Ile Thr Cys Gly Met Val Ser Ser Lys Leu Ala Pro Cys Ile Gly
 1 5 10 15

Tyr Leu Lys Gly Gly Pro Leu Gly Gly Gly Ser Ser Gly Gly Ile Lys
 20 25 30

Ala Leu Asn Ala Ala Ala Ala Thr Thr Pro
 35 40

(2) INFORMATION FOR SEQ ID NO:40:

- (i) SEQUENCE CHARACTERISTICS:
 (A) LENGTH: 43 amino acids
 (B) TYPE: amino acid
 (C) STRANDEDNESS: single
 (D) TOPOLOGY: linear

(ii) MOLECULE TYPE: peptide

(xi) SEQUENCE DESCRIPTION: SEQ ID NO:40:

Val Asp Cys Gly Gln Val Asn Ser Ser Leu Ala Ser Cys Ile Pro Phe
 1 5 10 15

Leu Thr Gly Gly Val Ala Ser Pro Ser Ala Ser Cys Cys Ala Gly Val
 20 25 30

Gln Asn Leu Lys Thr Leu Ala Pro Thr Ser Ala
 35 40

(2) INFORMATION FOR SEQ ID NO:41:

- (i) SEQUENCE CHARACTERISTICS:
 (A) LENGTH: 45 amino acids
 (B) TYPE: amino acid
 (C) STRANDEDNESS: single
 (D) TOPOLOGY: linear

(ii) MOLECULE TYPE: peptide

(xi) SEQUENCE DESCRIPTION: SEQ ID NO:41:

Val Leu Thr Cys Gly Gln Val Thr Gly Ala Leu Ala Pro Cys Leu Gly
 1 5 10 15

Tyr Leu Arg Ser Gln Val Asn Val Pro Val Pro Leu Thr Cys Cys Asn
 20 25 30

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Val Val Arg Gly Leu Asn Asn Ala Ala Arg Thr Thr Leu
 35 40 45

(2) INFORMATION FOR SEQ ID NO:42:

- (i) SEQUENCE CHARACTERISTICS:
 - (A) LENGTH: 44 amino acids
 - (B) TYPE: amino acid
 - (C) STRANDEDNESS: single
 - (D) TOPOLOGY: linear
- (ii) MOLECULE TYPE: peptide

(xi) SEQUENCE DESCRIPTION: SEQ ID NO:42:

Ala Leu Asn Cys Gly Gln Val Asp Ser Lys Asn Lys Pro Cys Leu Thr
 1 5 10 15
 Tyr Val Gln Gly Gly Pro Gly Gly Pro Ser Gly Leu Cys Cys Asn Gly
 20 25 30
 Val Arg Asp Leu His Asn Gln Ala Gln Ser Ser Gly
 35 40

(2) INFORMATION FOR SEQ ID NO:43:

- (i) SEQUENCE CHARACTERISTICS:
 - (A) LENGTH: 44 amino acids
 - (B) TYPE: amino acid
 - (C) STRANDEDNESS: single
 - (D) TOPOLOGY: linear
- (ii) MOLECULE TYPE: peptide

(xi) SEQUENCE DESCRIPTION: SEQ ID NO:43:

Ala Ile Ser Cys Gly Gln Val Ala Ser Ala Ile Ala Pro Cys Ile Ser
 1 5 10 15
 Tyr Ala Arg Gly Gln Gly Ser Gly Pro Ser Ala Gly Cys Cys Ser Gly
 20 25 30
 Val Arg Ser Leu Asn Asn Ala Ala Arg Thr Thr Ala
 35 40

(2) INFORMATION FOR SEQ ID NO:44:

- (i) SEQUENCE CHARACTERISTICS:
 - (A) LENGTH: 26 base pairs
 - (B) TYPE: nucleic acid
 - (C) STRANDEDNESS: both
 - (D) TOPOLOGY: linear
- (ii) MOLECULE TYPE: cDNA

(xi) SEQUENCE DESCRIPTION: SEQ ID NO:44:

AAAGAATTCA ARYTNTGYSA RMGNCC

(2) INFORMATION FOR SEQ ID NO:45:

- (i) SEQUENCE CHARACTERISTICS:
 (A) LENGTH: 32 base pairs
 (B) TYPE: nucleic acid
 (C) STRANDEDNESS: both
 (D) TOPOLOGY: linear

(ii) MOLECULE TYPE: cDNA

(xi) SEQUENCE DESCRIPTION: SEQ ID NO:45:

AAAGAATTCR TGNGCNGGRA ANACRTARTT RC

32

(2) INFORMATION FOR SEQ ID NO:46:

- (i) SEQUENCE CHARACTERISTICS:
 (A) LENGTH: 29 base pairs
 (B) TYPE: nucleic acid
 (C) STRANDEDNESS: both
 (D) TOPOLOGY: linear

(ii) MOLECULE TYPE: cDNA

(xi) SEQUENCE DESCRIPTION: SEQ ID NO:46:

AAAGAATTCG GNACNTGGWS NGGNGTNTG

29

(2) INFORMATION FOR SEQ ID NO:47:

- (i) SEQUENCE CHARACTERISTICS:
 (A) LENGTH: 9 base pairs
 (B) TYPE: nucleic acid
 (C) STRANDEDNESS: both
 (D) TOPOLOGY: linear

(ii) MOLECULE TYPE: cDNA

(xi) SEQUENCE DESCRIPTION: SEQ ID NO:47:

AAAGAATTC

9

(2) INFORMATION FOR SEQ ID NO:48:

- (i) SEQUENCE CHARACTERISTICS:
 (A) LENGTH: 414 base pairs
 (B) TYPE: nucleic acid
 (C) STRANDEDNESS: both
 (D) TOPOLOGY: linear

(ii) MOLECULE TYPE: cDNA

(ix) FEATURE:

- (A) NAME/KEY: CDS
 (B) LOCATION: 16..255

(xi) SEQUENCE DESCRIPTION: SEQ ID NO:48:

GT	TTT	TAT	TAG	TG	ATC	ATG	GCT	AAG	TTT	GCG	TCC	ATC	ATC	GCA	CTT	CTT	TTT		51
	Met	Ala	Lys	Phe	Ala	Ser	Ile	Ile	Ala	Leu	Leu	Phe							
	1				5							10							
GCT	GCT	CTT	GTT	CTT	TTT	GCT	GCT	TTC	GAA	GCA	CCA	ACA	ATG	GTG	GAA				99
Ala	Ala	Leu	Val	Leu	Phe	Ala	Ala	Phe	Glu	Ala	Pro	Thr	Met	Val	Glu				
		15					20					25							
GCA	CAG	AAG	TTG	TGC	GAA	AGG	CCA	AGT	GGG	ACA	TGG	TCA	GGA	GTC	TGT				147
Ala	Gln	Lys	Leu	Cys	Glu	Arg	Pro	Ser	Gly	Thr	Trp	Ser	Gly	Val	Cys				
		30				35					40								
GGA	AAC	AAT	AAC	GCA	TGC	AAG	AAT	CAG	TGC	ATT	AAC	CTT	GAG	AAA	GCA				195
Gly	Asn	Asn	Asn	Ala	Cys	Lys	Asn	Gln	Cys	Ile	Asn	Leu	Glu	Lys	Ala				
	45				50				55					60					
CGA	CAT	GGA	TCT	TGC	AAC	TAT	GTC	TTC	CCA	GCT	CAC	AAG	TGT	ATC	TGC				243
Arg	His	Gly	Ser	Cys	Asn	Tyr	Val	Phe	Pro	Ala	His	Lys	Cys	Ile	Cys				
				65				70						75					
TAC	TTT	CCT	TGT	TA	ATTT	TATCG	CAA	ACT	CTTT	GGTGA	ATAGT	TTTT	TATG	TAA					295
Tyr	Phe	Pro	Cys																
				80															
TTT	AC	ACAAA	ATA	AGTC	AGT	GTC	ACT	ATCC	ATG	AGT	GATT	TTA	AGAC	ATG	TACC	GAT	TAT		355
GTT	ATG	TTGG	TT	CGGT	TATA	CAA	ATAA	AGT	TTT	ATTC	ACC	AAAA	AAAA	AAAA	AAAA	AAAA	AAAA		414

(2) INFORMATION FOR SEQ ID NO:49:

(i) SEQUENCE CHARACTERISTICS:

- (A) LENGTH: 80 amino acids
- (B) TYPE: amino acid
- (D) TOPOLOGY: linear

(ii) MOLECULE TYPE: protein

(xi) SEQUENCE DESCRIPTION: SEQ ID NO:49:

Met	Ala	Lys	Phe	Ala	Ser	Ile	Ile	Ala	Leu	Leu	Phe	Ala	Ala	Leu	Val				
1				5					10					15					
Leu	Phe	Ala	Ala	Phe	Glu	Ala	Pro	Thr	Met	Val	Glu	Ala	Gln	Lys	Leu				
		20						25					30						
Cys	Glu	Arg	Pro	Ser	Gly	Thr	Trp	Ser	Gly	Val	Cys	Gly	Asn	Asn	Asn				
		35					40					45							
Ala	Cys	Lys	Asn	Gln	Cys	Ile	Asn	Leu	Glu	Lys	Ala	Arg	His	Gly	Ser				
	50				55						60								
Cys	Asn	Tyr	Val	Phe	Pro	Ala	His	Lys	Cys	Ile	Cys	Tyr	Phe	Pro	Cys				
	65				70					75					80				

(2) INFORMATION FOR SEQ ID NO:50:

(i) SEQUENCE CHARACTERISTICS:

- (A) LENGTH: 284 base pairs
- (B) TYPE: nucleic acid

(C) STRANDEDNESS: both
(D) TOPOLOGY: linear

(ii) MOLECULE TYPE: cDNA

(ix) FEATURE:

(A) NAME/KEY: CDS
(B) LOCATION: 1..108

(xi) SEQUENCE DESCRIPTION: SEQ ID NO:50:

GGA AAT AAT AAC GCA TGC AAG AAT CAG TGC ATT CGA CTT GAG AAA GCA 48
Gly Asn Asn Asn Ala Cys Lys Asn Gln Cys Ile Arg Leu Glu Lys Ala
1 5 10 15
CGA CAT GGG TCT TGC AAC TAT GTC TTC CCA GCT CAC AAG TGT ATC TGT 96
Arg His Gly Ser Cys Asn Tyr Val Phe Pro Ala His Lys Cys Ile Cys
20 25 30
TAT TTC CCT TGT TAATTCATA AACTCTTCGG TGGTTAATAG TGTGCGCATA 148
Tyr Phe Pro Cys
35
TTACATATAA TTAATAAGTT TGTGTCACTA TTTATTAGTG ACTTTATGAC ATGTGCCAGG 208
TATGTTTATG TTGGGTTGGT TGTAATATAA AAAAGTTCAC GGATAATAAG ATGATAAGCT 268
CACGTCGCCA AAAAAA 284

(2) INFORMATION FOR SEQ ID NO:51:

(i) SEQUENCE CHARACTERISTICS:

(A) LENGTH: 36 amino acids
(B) TYPE: amino acid
(D) TOPOLOGY: linear

(ii) MOLECULE TYPE: protein

(xi) SEQUENCE DESCRIPTION: SEQ ID NO:51:

Gly Asn Asn Asn Ala Cys Lys Asn Gln Cys Ile Arg Leu Glu Lys Ala
1 5 10 15
Arg His Gly Ser Cys Asn Tyr Val Phe Pro Ala His Lys Cys Ile Cys
20 25 30
Tyr Phe Pro Cys
35

(2) INFORMATION FOR SEQ ID NO:52:

(i) SEQUENCE CHARACTERISTICS:

(A) LENGTH: 36 base pairs
(B) TYPE: nucleic acid
(C) STRANDEDNESS: both
(D) TOPOLOGY: linear

(ii) MOLECULE TYPE: cDNA

(xi) SEQUENCE DESCRIPTION: SEQ ID NO:52:

ATAGAATTTCG ACGTGAGCTT ATCATCTTAT TATCCG

36

(2) INFORMATION FOR SEQ ID NO:53:

(i) SEQUENCE CHARACTERISTICS:

- (A) LENGTH: 21 base pairs
- (B) TYPE: nucleic acid
- (C) STRANDEDNESS: both
- (D) TOPOLOGY: linear

(ii) MOLECULE TYPE: cDNA

(xi) SEQUENCE DESCRIPTION: SEQ ID NO:53:

CTTGGCCTTT GGCACAACTT C

21

(2) INFORMATION FOR SEQ ID NO:54:

(i) SEQUENCE CHARACTERISTICS:

- (A) LENGTH: 21 base pairs
- (B) TYPE: nucleic acid
- (C) STRANDEDNESS: both
- (D) TOPOLOGY: linear

(ii) MOLECULE TYPE: cDNA

(xi) SEQUENCE DESCRIPTION: SEQ ID NO:54:

GCTTTCTCAA GTCTAATGCA C

21

(2) INFORMATION FOR SEQ ID NO:55:

(i) SEQUENCE CHARACTERISTICS:

- (A) LENGTH: 41 base pairs
- (B) TYPE: nucleic acid
- (C) STRANDEDNESS: both
- (D) TOPOLOGY: linear

(ii) MOLECULE TYPE: cDNA

(xi) SEQUENCE DESCRIPTION: SEQ ID NO:55:

AACTCGAGCT GCAGTGTCTGA CCTATTAACA AGGAAAGTAG C

41

(2) INFORMATION FOR SEQ ID NO:56:

(i) SEQUENCE CHARACTERISTICS:

- (A) LENGTH: 40 base pairs
- (B) TYPE: nucleic acid
- (C) STRANDEDNESS: both
- (D) TOPOLOGY: linear

(ii) MOLECULE TYPE: cDNA

009594.04304

(xi) SEQUENCE DESCRIPTION: SEQ ID NO:56:

GGAATAGCCG ATCGAGATCT AGGAAACAGC TATGACCATG

40

(2) INFORMATION FOR SEQ ID NO:57:

- (i) SEQUENCE CHARACTERISTICS:
(A) LENGTH: 24 base pairs
(B) TYPE: nucleic acid
(C) STRANDEDNESS: both
(D) TOPOLOGY: linear

(ii) MOLECULE TYPE: cDNA

(xi) SEQUENCE DESCRIPTION: SEQ ID NO:57:

GGAATAGCCG ATCGAGATCT AGGA

24

(2) INFORMATION FOR SEQ ID NO:58:

- (i) SEQUENCE CHARACTERISTICS:
(A) LENGTH: 288 base pairs
(B) TYPE: nucleic acid
(C) STRANDEDNESS: both
(D) TOPOLOGY: linear

(ii) MOLECULE TYPE: cDNA

(ix) FEATURE:

- (A) NAME/KEY: CDS
(B) LOCATION: 43..282

(xi) SEQUENCE DESCRIPTION: SEQ ID NO:58:

CCCCGGGCTG CAGGAATTCG CGGCCGCGTT TTATTAGTGA TC ATG GCT AAG TTT
Met Ala Lys Phe

54

1

GCG TCC ATC ATC GCA CTT CTT TTT GCT GCT CTT GTT CTT TTT GCT GCT
Ala Ser Ile Ile Ala Leu Leu Phe Ala Ala Leu Val Leu Phe Ala Ala
5 10 15 20

102

TTC GAA GCA CCA ACA ATG GTG GAA GCA CAG AAG TTG TGC CAA AGG CCA
Phe Glu Ala Pro Thr Met Val Glu Ala Gln Lys Leu Cys Gln Arg Pro
25 30 35

150

AGT GGG ACA TGG TCA GGA GTC TGT GGA AAC AAT AAC GCA TGC AAG AAT
Ser Gly Thr Trp Ser Gly Val Cys Gly Asn Asn Asn Ala Cys Lys Asn
40 45 50

198

CAG TGC ATT AGA CTT GAG AAA GCA CGA CAT GGA TCT TGC AAC TAT GTC
Gln Cys Ile Arg Leu Glu Lys Ala Arg His Gly Ser Cys Asn Tyr Val
55 60 65

246

TTC CCA GCT CAC AAG TGT ATC TGC TAC TTT CCT TGT TAATAG
Phe Pro Ala His Lys Cys Ile Cys Tyr Phe Pro Cys
70 75 80

288

09959504.04204

[illegible]

(A) LENGTH: 80 amino acids

(D) TOPOLOGY: linear

(xi) SEQUENCE DESCRIPTION: SEQ ID NO:59:

Cys Asn Tyr Val Phe Pro Ala His Lys Cys Ile Cys Tyr Phe Pro Cys
65 70 75 80